CLAIMS

1. A holographic multiplex recording method for forming recording spots, which are an overlapping projection region of an object beam and a reference beam, so as to be superimposed with a slight shift relative to one another in an X-axis direction and a Y-axis direction when interference fringes are formed in a recording layer in a holographic recording medium by projecting the object beam and the reference beam,

the holographic multiplex recording method comprising:

an X-axis direction first multiplex recording step of forming a first-stage multiplex recording spot matrix, comprising,

a step of forming a first recording spot matrix by forming and arranging recording spot rows comprising recording spots arranged with a constant pitch in the X-axis direction without overlapping, with a constant pitch in the Y-axis direction without overlapping,

a step of forming a second recording spot matrix by forming and arranging recording spot rows comprising recording spots slightly phase-shifted in the X-axis direction with respect to the first recording spot matrix and having the same phase and the same pitch in the Y-axis direction as those of the first recording spot matrix, with a constant pitch in the Y-axis direction without overlapping, and

a step of forming a third recording spot matrix to a last recording spot matrix by repeating formation of recording spot rows comprising recording spots slightly phase-shifted in the X-axis direction with respect to the recording spot rows of the previous recording spot matrix and having the same phase and the same pitch in the Y-axis direction as those of the recording spot rows of the previous recording spot matrix, with a constant pitch in the Y-axis direction without overlapping until immediately before the total sum of the phase shift in the X-axis direction from the first recording spot matrix to a last recording spot matrix becomes the same as the pitch between the recording spot rows in the X-axis direction; and

a step of forming a second-stage to a last-stage multiplex recording spot matrices by an X-axis direction second multiplex recording step to an X-axis direction last multiplex recording step which are similar to the X-axis direction first multiplex recording step and repeat thereof,

wherein: the total sum of the phase shift from the first recording spot matrix to the last recording spot matrix in the X-axis direction is set until immediately before the total sum becomes the same as the pitch between the recording spot rows in the X-axis direction; and

the X-axis direction second multiplex recording step to the X-axis direction last multiplex recording step are

performed by slightly shifting the phase relative to one another in the Y-axis direction with respect to each of the recording spot rows in the X-axis direction first multiplex recording step until immediately before the total sum of the phase shift in the Y-axis direction up to the X-axis direction last multiplex recording step becomes the same as the pitch between the recording spot rows in the Y-axis direction.

2. A holographic multiplex recording method for forming recording spots, which are an overlapping projection region of an object beam and a reference beam, so as to be superimposed with a slight shift relative to one another in an X-axis direction and a Y-axis direction when interference fringes are formed in a recording layer in a holographic recording medium by projecting the object beam and the reference beam,

the holographic multiplex recording method comprising:

a Y-axis direction first multiplex recording step of forming a Y-axis direction first recording spot matrix by arranging first-stage recording spot rows comprising recording spots arranged with a constant pitch in the X-axis direction without overlapping, in the Y-axis direction with a slight phase shift relative to one another;

a Y-axis direction second multiplex recording step of forming a Y-axis direction second multiplex recording spot matrix by arranging second-stage recording spot rows comprising recording spots arranged with a constant pitch in

the X-axis direction without overlapping with reference to a position slightly phase-shifted in the X-axis direction with respect to the first-stage recording spot rows, in the Y-axis direction with a slight phase shift relative to one another; and

a step of forming a Y-axis direction third multiplex recording spot matrix to a Y-axis direction last multiplex recording spot matrix by repeating a step which is similar to the above until immediately before the total sum of the phase shift in the X-axis direction from the Y-axis direction first multiplex recording spot matrix to a Y-axis direction last multiplex recording spot matrix becomes the same as the pitch between the recording spot rows in the X-axis direction.

3. A holographic multiplex recording method for forming recording spots, which are an overlapping projection region of an object beam and a reference beam, so as to be superimposed with a slight shift relative to one another in an X-axis direction and a Y-axis direction when interference fringes are formed in a recording layer in a holographic recording medium by projecting the object beam and the reference beam,

the holographic multiplex recording method comprising:

a first-stage X-axis direction multiplex recording step of forming an X-axis direction first-stage multiplex recording spot matrix, the step comprising,

an X-axis direction first multiplex recording step of

forming an X-axis direction first multiplex recording spot row by arranging recording spots in the X-axis direction with a slight phase shift relative to one another,

an X-axis direction second multiplex recording step of forming an X-axis direction second multiplex recording spot row by arranging recording spots with a slight phase shift relative to one another in positions parallel and adjacent to the X-axis direction first multiplex recording spot row and without overlapping in the Y-axis direction, and

a step of forming and sequentially arranging an X-axis direction third multiplex recording spot row to an X-axis direction last multiplex recording spot row in a similar manner; and

a step of forming an X-axis direction second-stage multiplex recording spot matrix to an X-axis direction last-stage multiplex recording spot matrix by a second-stage X-axis direction multiplex recording step to a last-stage X-axis direction multiplex recording step which are similar to the first-stage X-axis direction multiplex recording step and repeat thereof,

wherein, in the second-stage X-axis direction multiplex recording step to the last-stage X-axis direction multiplex recording step, the recording spots are repeatedly formed by slightly shifting the phase relative to one another in the Y-axis direction with respect to each of the X-axis direction

multiplex recording spot rows in the first-stage X-axis direction multiplex recording step until immediately before the total sum of the phase shift in the Y-axis direction up to the last-stage X-axis direction multiplex recording step becomes the same as the pitch between the X-axis direction multiplex recording spot rows in the Y-axis direction.